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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

TITLE: COLLAPSIBLE SUPPORT ASSEMBLY

INVENTOR: Dennis Remmers

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention generally relates to a sawhorse, and more particularly, a sawhorse that is fully collapsible and portable, yet stable. The sawhorse of the present invention is particularly beneficial in withstanding lateral and sheer forces with respect to its support frame, providing a structure that has an excellent strength to weight ratio, and providing a device that may be efficiently used in virtually all real-world conditions.

### 2. Background of the Invention

Sawhorses are one the most common tools known to mankind. In fact, these devices are used by handyman, carpenters, electricians, and just about every other skilled worker the world over. Efficient construction of virtually every residential or commercial building in all of industrialized society relies on the use of these devices.

In light of the vast use of sawhorses in the construction of virtually every newly erected structure, improvements in these devices may create an enormous cumulative benefit. For instance, it is easily seen that if one worker, or group of workers, is able to derive some decrease in project completion time- that time saving benefit may be reproduced with every

1 project of every job, with every worker or group of workers.  
2 The resulting cumulative benefit, or the tremendous time and  
3 cost saving provided, would be too large to calculate.

4 Obviously, in light of their enormous popularity,  
5 sawhorses are known in the art. And, while some invention are  
6 more beneficial than others, no known product is able to  
7 achieve the range or level of improvements, in one device,  
8 created by the present invention. For instance, a majority of  
9 sawhorses known in the art are made of wood, most of these  
10 devices rely on the use of 2x4's as their primary component.  
11 These products, such as those found in patent numbers  
12 4,926,966 and 4,570,752 may provide adequate support, are  
13 limited in view of the present device. That is, such devices  
14 are not easily portable and are often not stable when  
15 subjected to forces exerted on the device in any direction  
16 other than along the direction of gravity.

17 On the other end of the spectrum, there are devices like  
18 those taught in patent number 5,305,850. While these devices  
19 are more easily moved, they fail to provide an adequate  
20 strength to weight ratio and are no more to likely withstand  
21 various forces exerted upon the frame. As such, these devices  
22 would be suspect during heavy-duty use.

1           The present invention, through its highly unique design,  
2 is able to offer a range and level of benefits not previously  
3 possible with known products. For instance, the present  
4 device is lightweight and portable, yet sturdy enough for the  
5 heaviest of use. Further, construction of the present device  
6 provides a highly efficient way of collapsing and stabilizing  
7 the support frame. Also, the unique design of the present  
8 device provides an excellent strength to weight ratio.

9           Finally and most importantly, the stabilizing mechanism  
10 of the present invention allows the device to withstand forces  
11 not perpendicular to the plane of the support frame. That is,  
12 the present invention provides a device that is excellent at  
13 withstanding any combination of sheer or lateral forces with  
14 respect to the support frame.

15           In light of the shortcomings of the device known in the  
16 art, and the unique benefits provided by the present  
17 invention, it is easily seen that there is a tremendous need  
18 for a such as that of the present invention.

#### 19 20                           SUMMARY OF THE INVENTION

21           In view of the foregoing, it is an object of the present  
22 invention to provide a sawhorse that is excellent for  
23 withstanding any combination of sheer and lateral forces with

1       respect to its support frame.

2             It is another object of the present invention to provide  
3       a sawhorse that has an excellent strength to weight ratio.

4             It is another object of the present invention to provide  
5       a sawhorse that is durable.

6             It is another object of the present invention to provide  
7       a sawhorse that is easily collapsed.

8             It is another object of the present invention to provide  
9       a sawhorse that is easily constructed.

10            It is another object of the present invention to provide  
11       a sawhorse that is lightweight.

12            It is another object of the present invention to provide  
13       a sawhorse that is portable.

14            It is another object of the present invention to provide  
15       a sawhorse that is cost-effective.

16            In satisfaction of these and related objects, the present  
17       device provides a portable, yet extremely stable sawhorse that  
18       may can be used efficiently in virtually any construction-type  
19       project.

20            Practice of the present invention involves a horizontal  
21       support member that is attached at each end, by collapsible  
22       attachment means, to a set of first and second leg members.

1           The collapsible attachment means is comprised of a first  
2 and second horizontal flange, which are connected by a common  
3 base.   The horizontal flange base extends between each  
4 horizontal flange, connecting to both at their bottom side.  
5 First and second horizontal flanges are pivotally mounted to  
6 the front and back of the horizontal support beam and contain  
7 at least one hole through which a pivot pin is inserted.   The  
8 pivot pin traverses each horizontal flange and the horizontal  
9 support beam so as to provide a point by which the collapsible  
10 attachment means (and therefore the adjoined leg members) may  
11 be reversibly rotated from a vertical support position to a  
12 collapsed position.

13           Extending in a substantially perpendicular direction from  
14 said first and second horizontal flange is a leg member  
15 support frame.   Each leg member support frame consists of a  
16 first and second plate and a first and second limiting flange.  
17 Each leg member support frame serves to receive a set of first  
18 and second leg members and to hold the leg members in a stable  
19 support position or allow them to be fully collapsed.

20           Each first and second plate of each leg member support  
21 frame contains at least one hole so as to receive a pivot pin  
22 that traverses each plate and a leg member so as to allow the  
23 leg members to rotate between a first and second position

1 where the first position is a collapsed position where the leg  
2 members are juxtaposed to one another so that each is  
3 substantially parallel to the other and the second position is  
4 a support position where each leg member rests against the  
5 first or second limiting flange.

6 Importantly, a support piece is mounted to each first  
7 limiting flange. The support piece, at its top portion, is  
8 formed into an insert pin that reversibly engages a horizontal  
9 flange and the horizontal support member. In the engaged  
10 position, the support piece imparts extraordinary support to  
11 the device. At its bottom portion, the support piece is  
12 resistively pressed away from said first limiting flange,  
13 perhaps by a spring. The support piece may be depressed on  
14 its bottom end to disengage the support piece from the  
15 horizontal flange and the horizontal support member. Upon  
16 support piece disengagement, the collapsible attachment means  
17 (and therefore the adjoined leg members) may be moved to its  
18 collapsed position.

#### 19 BRIEF DESCRIPTION OF THE DRAWINGS

20 Figure 1 is a perspective view of the device of the  
21 present invention in its expanded, support position

22 Figure 2 is a cross section view of the device of the  
23 present invention.

1           Figure 3 is a sagittal view of the device of the present  
2 invention.

3           Figure 4a is a demonstrative view of the collapsible  
4 attachment means of the present device.

5           Figure 4b is a demonstrative view of the collapsible  
6 attachment means of the present device in its support  
7 position.

8           Figure 5 is a perspective view of the device of the  
9 present invention in its fully collapsed position.

10          Figure 6 is a perspective of the collapsible attachment  
11 means of the present invention.

#### 12 13           DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

14          Referring in combination to figures 1-6, and particularly  
15 figure 1 and 2, the device of the present invention is  
16 generally referred to by numeral 10. Device 10 may be  
17 primarily constructed from any suitably rigid material that is  
18 lightweight, yet strong enough to support reasonably expected  
19 loads. It is easily seen that successful embodiments of the  
20 present invention may be constructed primarily from high  
21 strength plastic, fiberglass, or some composite. In the  
22 preferred embodiment, device 10 is constructed primarily from  
23 aluminum.



1  
2       At its upper-most portion device 10 contains horizontal  
3 support member 12. In the preferred embodiment horizontal  
4 support member 12 contains, at each end, a set of pivot pin  
5 holes for receiving pivot pins 16 and a support piece slot 18  
6 (best illustrated in figure 6) meant for receiving support  
7 piece 60.

8       Attached at each end of horizontal support member 12 is  
9 collapsible attachment means 20. In the preferred embodiment,  
10 each collapsible attachment means 20 is comprised of a first  
11 and second horizontal flange 22 which are joined together by  
12 base member 23 (as best illustrated in figure 4a). Base  
13 member 23 extends under horizontal member 12 between each  
14 horizontal flange and attaches at their bottom side.

15       Each horizontal flange 22 contains a pivot pin hole meant  
16 for receiving pivot pin 16. Each horizontal flange 22 is  
17 attached to horizontal support member 12 at pivot pin hole by  
18 pivot pin 16. Pivot pin 16 traverses each horizontal flange  
19 22 and horizontal support 12 member so as to provide a point  
20 by which collapsible attachment means 20 may be reversibly  
21 rotated with respect to horizontal support member 12.  
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1 Collapsible attachment means 20 is further comprised of  
2 first and second plates 26, which face opposite each other,  
3 and a first and second divergently spread side wall flange 28.  
4 Plates 26 and side wall flanges 28 extend in a substantially  
5 perpendicular direction from horizontal support flanges 22.  
6 First and second plates 26 and first and second side wall  
7 flanges 28 are joined at right angles to one another so as to  
8 define an enclosure with an open bottom end for receiving leg  
9 members 50. In the preferred embodiment first and second  
10 plates 26 are tapered towards their top end and broaden toward  
11 their bottom ends so as to enable each side wall flange 28 to  
12 rest at an angle to support each leg member 50 in a fully  
13 expanded support position.

14 First and second plates 26 each contain at least one  
15 pivot pin hole 30 for receiving pivot pin 32. In the  
16 preferred embodiment, pivot pin 32 traverses plates 26 and  
17 leg member 50 so as to provide a point by which leg member 50  
18 may reversibly rotate between a first collapsed position and  
19 a second fully extended, support position.

20 As best illustrated in figure 2, support piece 60 is  
21 pivotally mounted to one side wall flange 28. As seen in  
22 figure 2, support piece 60, at its top portion, is formed into  
23 an insert pin 62 that reversibly engages horizontal flange 22

1 at slot 25, and horizontal support member 12 at slot 18. In  
2 the engaged position, the support piece imparts extraordinary  
3 support to device 10. At its bottom portion, support piece 60  
4 is resistively pressed away from side wall flange 28. In the  
5 preferred embodiment this is done by some resistive device  
6 such as a spring (not shown in the drawings). Support piece  
7 60 may be depressed on its bottom end to disengage support  
8 piece 62 from horizontal flange 22 and horizontal support  
9 member 12. Upon disengagement of support piece 60,  
10 collapsible attachment means 20 (and therefore the adjoined  
11 leg members) may be moved to its collapsed position.

12 Extending from, and pivotally attached to plates 26 is a  
13 pair of individual leg members 50. Leg members 50 may be  
14 adjusted between collapsed and support positions. In the  
15 support position (figs. 1-4), each leg member 50 rests against  
16 side wall flange 28. In the collapsed position (figs. 5-6),  
17 leg members 50 rest substantially parallel to one another.

18 In the preferred embodiment, a hinged strap 64 extends  
19 between each leg member 50 so as to provide further support  
20 and further prevent the leg members from spreading too far  
21 apart. As the leg members 50 move toward one another, strap  
22 64 collapses at its hinge point. Alternative embodiments are  
23 envisioned where strap 64 is in the form of some semi-rigid or

1 rope material that may also perform the intended functions.

2 Although the invention has been described with reference  
3 to specific embodiments, this description is not meant to be  
4 construed in a limited sense. Various modifications of the  
5 disclosed embodiments, as well as alternative embodiments of  
6 the inventions will become apparent to persons skilled in the  
7 art upon the reference to the description of the invention.  
8 It is, therefore, contemplated that the appended claims will  
9 cover such modifications that fall within the scope of the  
10 invention.  
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